

## Colorado Department of Health

## Review and Comment

Technical Memorandum (TM) 9 - Chemicals of Concern  
December, 1993

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General Comments:

1) DOE and its contractors did a good job of presenting and summarizing much of the required data for this TM. The maps clearly displayed sampling locations and locations where contaminants were found. The Division appreciates the clear presentation of information such as which chemicals were included or excluded from the COC list, the generally clear reasons why chemicals were eliminated from consideration, and the clear statement that individual chemicals for which no toxicity data exists would be considered in a qualitative risk assessment. DOE and its contractors did a much better job at data presentation in this TM than in many of the previous efforts that they have sent to us.

2) DOE's methodology for determining COCs does not deal with potential hotspots very well. We had several problems with the methodology, which are detailed below.

a) DOE's OU 1 Professional Judgement Criteria No. 1 states that a constituent will not be considered a COC when "frequency of background UTL (or max value, whichever is reported) exceedance is less than or equal to 5%, and data do not indicate a "hotspot" exists." As stated, this is not professional judgement, but rather only applying the COC flowchart. For instance, when a chemical does not meet the 5% and "hotspot" cutoffs, but there is reason to believe that other aspects of the situation may warrant further evaluation, professional judgement is used to decide whether the chemical is, or is not, a COC. There are several cases, such as with arsenic and cadmium in subsoil, where the data indicate that detects may be associated with known or previously unknown source areas. However, these cases are ignored in many instances since they are a small percentage of all the data for that chemical in that particular media. The Division requires that if any indication of localized contamination exists, it must be followed up and investigated further. Potential hotspots or localized

sources cannot be ignored simply because they do not make up a large percentage of the detects. In addition, the Division believes that DOE needs to statistically or otherwise define localized sources within a broader area of low contamination.

b) It was obvious that the method obtained by compromise between CDH, DOE and EPA for determining COCs does not adequately address "hot spots" or source areas. The 1000 x RBC rule eliminates too many chemicals that are clearly associated with waste-disposal sites. This problem was especially apparent in the review of subsoil contaminants, but there are clear examples in the other two media as well. Chemicals clearly located in areas known to be waste-disposal areas, such as the trenches, were eliminated from consideration as COCs because they did not exceed the 1000 x RBC screen. This occurred even though there is a good possibility they are associated with hotspots.

c) DOE's methodology does not adequately consider the possibility of previously unknown or unrecorded sources. The history of waste disposal at the RFP is not recorded well enough for the lack of any information about a site to be the main reason why a possible hotspot is not considered. A number of chemicals in all the medias were eliminated from consideration as COCs because they were not associated with known source areas. The Division believes that some of the chemicals eliminated for this reason could be indications of previously unknown localized contamination. Further proof that the latter is not the case is required before the chemicals are eliminated, especially given the size of the sampling grids. This would be true even if the apparent hotspot is next to Indiana Street.

3) Neither CDH nor EPA agreed to Professional Judgement Criteria No. 10, "Significant differences with respect to background for groundwater are not consistent for total and filtered results". This criteria was used to eliminate aluminum and lead from consideration as COCs in groundwater found on OU2. The main problem we have with this criteria is that many drinking water wells are not filtered, resulting in humans being exposed to suspended particles in drinking water. All HHRAs must assess total groundwater contaminants, not only those found in the dissolved fraction. In order for the Division to accept the idea that aluminum or lead are associated with clay particles, and are the result of naturally occurring metals, more information on the turbidity and clay content of the water samples, and the composition of the local clay needs to be supplied. The mere statement that other naturally occurring metals were also elevated in the samples is not sufficient, particularly since the iron data referred to on p. 3-6 was not even displayed in this document.

4) The Division appreciates the extra effort DOE went through in order to test whether manganese and barium contamination were

associated with a VOC plume (p. 3-5 & 3-6). Before we can accept the results as indications that these two metals are not groundwater contaminants related to the site activities, however, we need to see the statistical tests that were done to decide that a 2-fold difference in percentages of detects found in VOC plume areas and non-VOC plume areas were not significant. In addition, we would also like to see a table of relative concentrations of the detects in VOC areas compared to non-VOC plume areas.

This kind of detailed assessment of the potential for movement within a media like soil and of the bioavailability of contaminants is something we would like to see for all potential COCs before they are eliminated from the list. This request is consistent with RAGS (p.5-21), which recommends that mobility, persistence, and bioaccumulation be considered before eliminating chemicals from a risk assessment. Therefore, we also would like information as to whether other chemicals detected in groundwater but eliminated as COCs, particularly very toxic ones like lead, are associated with a VOC plume, or low pH areas.

5) The temporal argument DOE uses to eliminate some chemicals from consideration on the COC list is a strong argument. However, the criteria DOE used in their spatial argument are not clear, and need to be better defined. Words like "near" are not specific enough in defining sampling locations. For example, what is meant by "post 1987 samples collected near locations previously sampled during the 1987 sampling program did not confirm the presence of elevated concentrations" of arsenic in subsoil? (p.4-5)

#### Specific comments:

Page 2-4: It is not a big point right here, but the criteria mentioned under Step 8 in association with spatial and temporal distributions, namely that a chemical must be "detected in association with elevated concentrations of other COCs", was not agreed to by CDH and EPA during the Professional Judgement discussions in July-August for OU1.

Page 2-14: CDH believes that any chemical in groundwater that is very volatile and that could pose a significant risk via inhalation during home use of contaminated water, such as during showering, should not be eliminated from the risk assessment. This is consistent with RAGS (p. 5-21). This criteria apparently was not considered when VOCs were eliminated from consideration in this TM. We would especially like this criteria to be considered for volatile Group A carcinogens such as vinyl chloride.

#### Ground Water COCs

Page 3-2: RAGS (p. 5-21) states, that, "Chemicals reliably

associated with site activities based on historical information generally should not be eliminated from the quantitative risk assessment, even if the results of the procedures given in this section" (meaning the elimination of chemicals from the COC list), "indicate that such an elimination is possible". As such, the Division does not agree that chemicals like methylene chloride and lead should have been taken out of the list of COCs. Reliable information indicates that both of these chemicals were used extensively in the past at Rocky Flats (CDH and ChemRisk, Final Draft Report, Project Tasks 3 & 4, Reconstruction of Historical Rocky Flats Operations and Identification of Release Points, 1992).

Page 3-4: The elimination of aluminum and of lead because of the lack of detects in dissolved groundwater was discussed above in General comment B-1.

Page 3-5: What is the justification for ignoring the arsenic detected in well 10991? Arsenic is a Group A carcinogen. This well is located in the East Spray Fields, and no other No. 1 Sandstone wells exist in the area to determine the areal extent of contamination. Why is this not considered localized contamination?

Page 3-7: What is meant by "the upper paired wells were nondetect for mercury"? Why wasn't the one well (11691 in the NE Trench Area) which had mercury detected in more than one sampling event treated as localized contamination or as a hotspot?

Page 3-5 and 3-6: The Division would like more information on whether there was a concentration difference between the barium and manganese detects in VOC plume area compared to non-VOC plume areas. Where is the data on iron which was mentioned on p.3-6 under Pb?

Page 3-8: Please explain why the well where cesium was detected more than once above background UTL levels was not considered a hotspot.

Page 3-10: Were subsequent samples from well 5691 also elevated in zinc? Is this another area of possible localized contamination?

Page 3-12: Please explain why well 3586 is not considered a site of potential localized contamination?

Table 3-17: p-Phlorotoluene is a typo.

General: The Division requests that 1,1,2,2-tetrachloroethane, 1,1,2-TCA, 1,2-dichloroethane, dibromomethane, hexachlorobutadiene, and 1,2-dibromo-3-chloropropane be added to the list of COCs since they all exceed the RBC (PRG), and represent confirmed, albeit localized contamination.

### Subsurface Soils COCs:

Page 4-5: Some detects of arsenic could be related to waste disposal, yet they were eliminated because they did not pass the 1000 x RBC rule. They did exceed the RBC (PRG). Therefore, the Division requests that arsenic be retained as a COC.

DOE called the validity of the 1987 sampling program for arsenic into question because later sampling "near locations previously sampled during the 1987 sampling program did not confirm the presence of elevated concentrations." However, no map was supplied to show the 1987 sampling locations compared to the later sampling locations. We would like a map showing the locations of 1987 arsenic sampling points compared to later sampling points. In addition, we would like a more detailed listing than that found in Table 4-1B of sampling results for arsenic obtained in 1987 compared to the values obtained at later times. The summary data supplied in Table 4-1B does not provide sufficient detail for us to adequately compare arsenic detects obtained during the different sampling programs.

A similar situation applies to cadmium in subsoil. While most cadmium detects also are not clearly associated with known waste-disposal sites, cadmium was detected in Trench T-4 (p.4-6). Again, because the cadmium concentration did not exceed the 1000 x RBC criteria in the special case chemicals screen, it was eliminated from consideration as a COC. Therefore, the Division requests that cadmium be retained on the COC list.

Page 4-6: Unvalidated 1987 data indicated mercury was localized in one spot, but unrelated to known source areas. Therefore, it was eliminated as a COC. This is not a valid reason for elimination. Please explain why this could not it be associated with an unknown source?

Page 4-7: Uranium was retained as a special case COC, even though its occurrence was not different from other chemicals that were eliminated. This example amplifies the inconsistency between treatment of radionuclides and non-radionuclides and why the Division has requested that certain constituents discussed elsewhere in these comments be retained as COCs.

Page 4-9: The text states that "no infrequently detected compounds in subsurface soils were present" at levels exceeding the 1000 x RBC.

General: The Division requests that arsenic, cadmium, Aroclor 1254 and benzo(a)pyrene all be retained on the list of COCs.

Surface Soils COCs:

Page 5-2: PAHs were localized at the Pallet Burn site, and therefore included in the RBC screen. However, they did not exceed the 1000 x RBC level. The Division requests that any PAH that exceeded the RBC be retained on the COC list.

Page 5-4: Tin and radium-226 both could be associated with localized contamination or hotspots, but were eliminated because the detects were located far from known OU2 source areas. This is inappropriate. The history of waste disposal at Rocky Flats is not so well known that every disposal can be accounted for. These two chemicals should be kept in the COC list, even if they were detected close to Indiana Street.